

Application No. 09/675,548
Amendment dated April 8, 2005
Reply to Office action of January 14, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1 - 2 (Canceled)

Claim 3 (Currently Amended) An apparatus based on a telecentric imaging system for forming an image of a linear zone of an object, the apparatus comprising:
a non-telecentric camera comprising an objective and an image plane formed of a row of photosensitive cells;

5 telecentric imaging means placed between the objective and the object, said telecentric imaging means comprising a concave strip mirror, said concave strip mirror substantially aligned with said row of cells, and the aperture of said objective being located in the focal plane of the concave strip mirror, the concave strip mirror and the objective jointly forming a telecentric image of the object on the row of photosensitive cells;

10 a light source producing radiation directed to the object, wherein said concave strip mirror is a planar parabolic mirror; and

a strip-like fully reflective plane mirror disposed between said parabolic mirror and the objective, through which the directed radiation reflected from the object and the parabolic mirror strikes the objective and then the image plane in order to obtain a sharp image of the width parts of the object;

15 wherein the lengths (L2 and L1) of said strip-like planar parabolic mirror and strip-like plane mirror are mutually aligned and aligned with the row of photosensitive cells forming the image plane; and that the reflective surfaces of the strip-like plane mirror and said strip-like planar parabolic mirror are directed towards each other such that the width of each is reflected from the reflective surface of both at a predetermined angle;

20 The apparatus as defined in claim 2, wherein the distance of the strip-like plane mirror from the objective is at least 1.5 times the distance of the planar parabolic

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mirror from the objective; and that the plane mirror and the planar parabolic mirror are mutually spaced by a distance perpendicular to their length, the distance being at least equal
25 to half of the combined width of these mirrors and at the most five times the combined width of these mirrors.

4. (Currently Amended) An apparatus based on a telecentric imaging system for forming an image of a linear zone of an object, the apparatus comprising:

a non-telecentric camera comprising an objective and an image plane formed of a row of photosensitive cells;

5 telecentric imaging means placed between the objective and the object, said telecentric imaging means comprising a concave strip mirror, said concave strip mirror substantially aligned with said row of cells, and the aperture of said objective being located in the focal plane of the concave strip mirror, the concave strip mirror and the objective jointly forming a telecentric image of the object on the row of photosensitive cells;

10 a light source producing radiation directed to the object, wherein said concave strip mirror is a planar parabolic mirror; and

a strip-like fully reflective plane mirror disposed between said parabolic mirror and the objective, through which the directed radiation reflected from the object and the parabolic mirror strikes the objective and then the image plane in order to obtain a sharp image of the width parts of the object;

wherein the lengths (L2 and L1) of said strip-like planar parabolic mirror and strip-like plane mirror are mutually aligned and aligned with the row of photosensitive cells forming the image plane; and that the reflective surfaces of the strip-like plane mirror and said strip-like planar parabolic mirror are directed towards each other such that the width of each is reflected from the reflective surface of both at a predetermined angle;

The apparatus as defined in claim 2, wherein the normal to the reflective surface of the strip-like planar parabolic mirror is at a maximum 30° angle relative to the

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normal to the object, and that the angle between the normals to the reflective surfaces of the planar parabolic mirror and the plane mirror is 30° at the most.

5. (Currently Amended) The apparatus as defined in claim 34, wherein the length of the strip-like planar parabolic mirror is substantially greater than its width; and that at least the length of the planar parabolic mirror is greater than the width of the object to be observed.

6. (Currently Amended) The apparatus as defined in claim 32, wherein the reflective surface of the planar parabolic mirror, and the strip-like plane mirror is a metal surface which is open at the reflection side.

7. (Currently Amended) The apparatus as defined in claim 34, wherein the light source is a scattered light source which is independent of the telecentric imaging means and is located adjacent to the telecentric imaging means at a distance transverse to the direction of movement of the radiation passing through them, whereby said imaging means receive scattered light reflected from the object.

5 8. (Currently Amended) An apparatus based on a telecentric imaging system for forming an image of a linear zone of an object, the apparatus comprising:

a non-telecentric camera comprising an objective and an image plane formed of a row of photosensitive cells;

5 telecentric imaging means placed between the objective and the object, said telecentric imaging means comprising a concave strip mirror, said concave strip mirror substantially aligned with said row of cells, and the aperture of said objective being located in the focal plane of the concave strip mirror, the concave strip mirror and the objective jointly forming a telecentric image of the object on the row of photosensitive cells;

10 a light source producing radiation directed to the object, wherein said concave
strip mirror is a planar parabolic mirror; and
a strip-like fully reflective plane mirror disposed between said parabolic
mirror and the objective, through which the directed radiation reflected from the object and
the parabolic mirror strikes the objective and then the image plane in order to obtain a sharp
15 image of the width parts of the object;
wherein the light source is a scattered light source which is independent of the
telecentric imaging means and is located adjacent to the telecentric imaging means at a
distance transverse to the direction of movement of the radiation passing through them,
whereby said imaging means receive scattered light reflected from the object;
20 wherein said transverse distance of the scattered light source is substantially
smaller than the distance between the planar parabolic mirror and the object; and that said
scattered light source comprises one or more lamps having a substantial area, the more than
one lamps being mutually spaced principally over the width of the object by distances
parallel with the length of the planar parabolic mirror in order to provide a substantially
25 homogenous scattered light at the object.

Claims 9 - 10 (Canceled)

11. (Previously Presented) The apparatus as defined in claim 3, wherein the normal to the reflective surface of the strip-like planar parabolic mirror is at a maximum 30° angle relative to the normal to the object, and that the angle between the normals to the reflective surfaces of the planar parabolic mirror and the plane mirror is 30° at the most.

12. (New) The apparatus as defined in claim 8, wherein the normal to the reflective surface of the strip-like planar parabolic mirror is at a maximum 30° angle relative

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to the normal to the object, and that the angle between the normals to the reflective surfaces of the planar parabolic mirror and the plane mirror is 30° at most.

13. (New) The apparatus as defined in claim 7, wherein said transverse distance of the scattered light source is substantially smaller than the distance between the planar parabolic mirror and the object; and that said scattered light source comprises one or more lamps having a substantial area, the more than one lamps being mutually spaced 5 principally over the width of the object by distances parallel with the length of the planar parabolic mirror in order to provide a substantially homogenous scattered light at the object.

14. (New) The apparatus as defined in claim 4, wherein the distance of the strip-like plane mirror from the objective is at least 1.5 times the distance of the planar parabolic mirror from the objective; and that the plane mirror and the planar parabolic mirror are mutually spaced by a distance perpendicular to their length, the distance being at 5 least equal to half of the combined width of these mirrors and at the most five times the combined width of these mirrors.

15. (New) The apparatus as defined in claim 4, wherein the length of the strip-like planar parabolic mirror is substantially greater than its width; and that at least the length of the planar parabolic mirror is greater than the width of the object to be observed.

16. (New) The apparatus as defined in claim 4, wherein the reflective surface of the planar parabolic mirror, and the strip-like plane mirror is a metal surface which is open at the reflection side.

17. (New) The apparatus as defined in claim 4, wherein the light source is a scattered light source which is independent of the telecentric imaging means and is located

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adjacent to the telecentric imaging means at a distance transverse to the direction of movement of the radiation passing through them, whereby said imaging means receive
5 scattered light reflected from the object.

18. (New) The apparatus as defined in claim 17, wherein said transverse distance of the scattered light source is substantially smaller than the distance between the planar parabolic mirror and the object; and that said scattered light source comprises one or more lamps having a substantial area, the more than one lamps being mutually spaced
5 principally over the width of the object by distances parallel with the length of the planar parabolic mirror in order to provide a substantially homogenous scattered light at the object.

19. (New) The apparatus as defined in claim 14, wherein the normal to the reflective surface of the strip-like planar parabolic mirror is at a maximum 30° angle relative to the normal to the object, and that the angle between the normals to the reflective surfaces of the planar parabolic mirror and the plane mirror is 30° at the most.

20. (New) The apparatus as defined in claim 8, wherein the lengths (L2 and L1) of said strip-like planar parabolic mirror and strip-like plane mirror are mutually aligned and aligned with the row of photosensitive cells forming the image plane; and that the reflective surfaces of the strip-like plane mirror and said strip-like planar parabolic mirror
5 are directed towards each other such that the width of each is reflected from the reflective surface of both at a predetermined angle.

21. (New) The apparatus as defined in claim 20, wherein the distance of the strip-like plane mirror from the objective is at least 1.5 times the distance of the planar parabolic mirror from the objective; and that the plane mirror and the planar parabolic mirror are mutually spaced by a distance perpendicular to their length, the distance being at

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5 least equal to half of the combined width of these mirrors and at most five times the combined width of these mirrors.

22. (New) The apparatus as defined in claim 20, wherein the normal to the reflective surface of the strip-like parabolic mirror is at a maximum 30° angle relative to the normal to the object, and that the angle between the normals to the reflective surfaces of the planar parabolic mirror and the plane mirror is 30° at the most.

23. (New) The apparatus as defined in claim 8, wherein the length of the strip-like planar parabolic mirror is substantially greater than its width; and that at least the length of the planar parabolic mirror is greater than the width of the object to be observed.

24. (New) The apparatus as defined in claim 20, wherein the reflective surface of the planar parabolic mirror and the strip-like plane mirror is a metal surface which is open at the reflection side.

25. (New) The apparatus as defined in claim 21, wherein the normal to the reflective surface of the strip-like planar parabolic mirror is at a maximum 30° angle relative to the normal to the object, and that the angle between the normals to the reflective surfaces of the planar parabolic mirror and the plane mirror is 30° at the most.